AMERICAN NEUROLOGICAL ASSOCIATION.

Held in Washington, May 7, 8 and 9, 1907.

The President, Dr. Hugh T. Patrick, in the Chair.

(*Continued from page 776, 1907.*)

Traumatic Lesion of the Pons and Tegmentum with Direct and Retrograde Degeneration of the Median Fillet and Pyramid, and of the Homolateral Olive. By Dr. Adolf Meyer. (*See this journal,* 1907, p. 699.)

Dr. W. G. Spiller said he was exceedingly interested in Dr. Meyer's report, and while he has the greatest admiration for Dr. Meyer's work, he is somewhat in doubt as to the practical value of glass reconstruction, particularly as to whether it is of great benefit to the undergraduate student or not. Those who teach undergraduate students know how hard it is for students to obtain a knowledge of the finer anatomy of the central nervous system. Dr. Spiller believes that before any student can grasp what Dr. Meyer had presented, it is necessary for him to make microscopical sections of many different portions of the brain, and to study them carefully, as well as the region of the brain from which the sections are taken. When he has done that he will not need the glass reproductions.

As for the separate slides which Dr. Meyer showed, Dr. Spiller thinks that the actual sections showing the lesions are more valuable for demonstrations than drawings made from them. In his lectures on neuropathology Dr. Spiller uses the microscopical slides in the lantern. As for putting the glass slides together afterward, as Dr. Meyer does, this might be of assistance to a student who had done some work in neuropathology and was therefore able to enter into the details of Dr. Meyer's pathological findings.

Dr. Spiller said he had been especially interested in Dr. Meyer's description of the median fillet, and it happens that he has been examining recently a case in which the median fillet was destroyed by a lesion in the lower part of the medulla oblongata, and the degeneration extended from that point as high as the level of the red nuclei.

Dr. H. H. Donaldson said he was sorry to differ with Dr. Spiller on this point, but he thought one should emphasize the idea which Dr. Meyer had brought forward, that by use of these drawings, either on paper or upon glass, it is possible to differentiate before the student those portions of the section concerning which we may make moderately complete and accurate statements, and draw attention, by contrast, to the parts of the section which contain structures that are still in need of interpretation.

As regards the glass models, Dr. Donaldson said that his experience with classes had been that the most difficult thing for the student to get was the three dimensional relation of the parts, and these glass models were particularly well suited to give the three dimensional picture, which was better than the projection on the screen would indicate.

Dr. A. R. Allen said he considered the chief benefit to be gained by this glass reconstruction was that it gave the student a much better geometrical conception—the third dimension concept—of the architecture of the brain than any other method of illustration.

Dr. B. Onuf said he could only voice Dr. Donaldson's and Dr. Allen's sentiments as to the value of this method. He thought that for plasticity, for showing the special relation of fiber tracts, it has an extreme merit. To give an illustration, he said he believes it happens to many of us to have only a hazy view of the spatial relation between the fillet and the superior cerebellar peduncle, and the relations of the three cerebellar peduncles to each other, and he thought all these things cannot properly be brought out by wax models.

Dr. C. K. Mills said he could only join with the others in commending and approving of the work of Dr. Meyer, and would attach value to this method, although perhaps not fully capable of appreciating it. He said there was one thing he would like to call attention to. Dr. Meyer has spoken (and it seems to be a common feeling nowadays) of the little value, or relatively little value, of "schemes" in teaching. He said it is quite true that, if the schemes of to-day were like the schemes of localization of the sixteenth century, for instance, or even many of those of the last century, originating chiefly in the inner consciousness or in the fancy of those who invented the schemes, they would be of little value. Marie has delivered himself of opinions somewhat similar in regard to the schematic representation of aphasia.

Schemes and diagrams are worthless or valuable according as they are faithful representations of good or bad inductive or deductive methods. Dr. Meyer's glass reconstruction is one of the latest and best of these methods.

Dr. A. Meyer said that the trouble about the schematic method lies in the fact that so many things are apt to be introduced without sufficient proof that the points really represent insufficiently established facts. The method presented is as objective as possible and still has the simplicity of a scheme.

With regard to the question of the fillet concerning which Dr. Spiller remarked on marked downward and upward degeneration, Dr. Meyer said that we are dealing there with principles which hold for all central degenerations. It is the principle that he (Dr. Meyer) spoke of at the demonstration concerning the optic apparatus. In the central nervous system, degeneration involves the entire elements; especially when the lesion is near enough to the cells of origin there is always a complete degeneration of that mechanism, consequently the Wallerian law requires adjustment in this field.

The Symptomatology of the Lesions of the Lenticular Zone, with Some Discussion of the Pathology of Aphasia. By Dr. Charles K. Mills and Dr. William G. Spiller. (*See this journal,* p. 558, 1907.)

Lesions of the Corpus Striatum and Lenticular Zone. By Dr. Charles L. Dana. (*See this journal,* p. 65.)

A Case of Aphasia, Both "Motor" and "Sensory," with Integrity of the Left Third Frontal Convolution: Lesion in the Lenticular Zone and Inferior Longitudional Fasciculus. By Dr. F. X. Dercum. (*See this journal,* p. 681, 1907.)

Dr. Prince said there were one or two points which he would like to bring up; one is in regard to this motor defect. As Dr. Prince understands Drs. Mills and Spiller and also Dr. Dercum, they consider that the motor defect is entirely an inability to co-ordinate or correlate the movements necessary for speech, and that the inability to do that is due to a lesion of the lenticular nucleus. It seemed to Dr. Prince that that is substantially the same view as Marie's. Marie maintains very definitely that the motor defect, the anarthria, as he chooses to call it, is not a total loss of motion for all purposes, of those parts which are used in speech, the tongue, throat, larynx, pharynx, but the inability to use them for purposes of speech alone, and he locates this function in the lenticular zone, which Dr. Prince takes it, includes the lenticular nucleus and the whole neighborhood. Aside from the question of location there may be this difference between Marie's anarthria and the motor aphasia of the readers; namely, patients with anarthria know what they want to say, while with motor aphasia they do not. A person who has inability to use his paralyzed muscles to co-ordinate them should know what he wants to say if it is a matter of speech, or know how he wants to move his paralyzed arm if it is a matter of the limb. Stammering from one point of view is anarthria, but a stammerer knows what he wants to say and could not be called aphasic. This is a point which wants clearing up. Dr. Prince understood from Dr. Mills and Dr. Spiller's report that their patients did not know what they wanted to say. If it can be shown that a lesion of the lenticular nucleus causes loss of speech with loss of internal language it would be a severe blow to the doctrine of Marie; but can it be said that that defect with a lesion of the lenticular nucleus is due to the latter alone and not to implication of the third frontal convolution, that the cells in the latter are not affected? (Remarks unfinished on acount of time limit.)

Dr. P. C. Knapp said, in answer to the point which Dr. Prince had just brought up with regard to the patients knowing what they want to say, that in some cases the patients evidently have at least some idea as to what they want to say, and yet there seems to be considerable mental defect. A patient recently under observation showed sufficient mental impairment to warrant commitment to an asylum. In this case there was some defect to be found in every manifestation of the motor and sensory sides of speech, yet she could understand some questions and begin a sentence reasonably well with fair intelligence, but would then lapse into a jargon aphasia. It seemed to Dr. Knapp that the cases of Dr. Mills, Dr. Spiller, and Dr. Dercum have shown pretty conclusively something which, if his memory does not fail him, they seemed disposed to deny at the meeting of the New York and the Philadelphia Neurological Society in Philadelphia; namely that there can be a destruction of Broca's convolution without motor aphasia, and destruction of Wernicke's convolution, without sensory aphasia.

Dr. B. Onuf said he was interested in what Dr. Mills and Dr. Spiller said regarding the lenticular nucleus and wished to give some of his personal experiences on this point. He and Dr. Fraenkel in three personal cases with autopsy and 102 cases collected from the literature, studied the subject of aphasia. They had had one case of dysarthria, that is a mechanical disturbance of speech in which there was practically total destruction of the lenticular nucleus and of the lenticular zone in general. Dr. Onuf said if he remembered aright Dr. Marie defines as the lenticular zone the white substance between the cortex of the insula and the lenticular nucleus plus the outer layers of the lenticular nucleus. In this case there was practical destruction of this zone, only a corner the size of a bean in the lenticular nucleus being left. There was nevertheless no aphasia, but only a mechanical disturbance of speech. This would rather speak against considering the lenticular zone as connected with the function of speech in the manner in which Dr. Mills, Dr. Spiller and Dr. Dana have pronounced it. These disagreements may perhaps be reconciled and harmonized by taking the view which Dr. Fraenkel and he have put forth, that the centers of the lower end of the central convolutions form a so-called articulomotor center (Elder); that they are directly connected with the mechanical act of speech, and that this center is connected with Broca's convolution by an association tract, and that lesion of this association tract would make it impossible for Broca's convolution to continue its control of the articulomotor center and would then give the picture of so-called sub-cortical motor aphasia. The anatomical basis of this subcortical motor aphasia has so far found very few clear substrata; that is, there are very few cases reported in which the lesion was small enough to define with reasonable certainty the locality which gives rise to this form of aphasia. In one case reported by Edinger, however, in which there was a very small, very circumscribed lesion, the lesion would quite conform to the view they had put forth. It was a lesion between the medullary layers of the second and third frontal convolutions, really in the third frontal convolution, but it was situated in the centrum ovale where it joins the medullary layers of the third frontal convolution. This view may be reconciled with the finding of lesions of the lenticular zone in as far as a lesion of the lenticular zone is very apt to pass over towards the third frontal convolution.

Dr. Prince wished to conclude the last point he had begun to make; namely, that it seemed to him absolutely impossible to say that the third frontal convolution is not affected in such cases as those reported unless we use the same method which Campbell used in his work; that is to say, Campbell's work depended very largely upon the detection of changes in the motor cells brought about by the *"reaction à distance,"* that is retroactive changes, secondary to lesion of the peripheral termination of the neurones. Dr. Spiller, who was the first to use that method in amyotrophic lateral sclerosis, had shown changes in the cortex in that disease. Similarly it may well be that the third frontal may be affected by a lesion of the lenticular nucleus in its neighborhood. A microscopic examination alone would reveal it.

Dr. Mills said in the first place regarding what Dr. Dana said about the lenticula being a vestigial organ, Dr. Dercum has said what he (Dr. Mills) would say in answer to this. With regard to the gas poisoning cases Dr. Mills said it must be remembered that the cases referred to were instances of acute poisoning, and coma being present simply means that all study of other symptoms of lenticular lesion was obscured.

Dr. Dercum, like Marie, seems to be obscuring issues by including in the lenticular zone regions like the insula which have functions entirely distinct from the lenticula. What part in speech, according to Dr. Dercum, does the insula play? He, Dr. Mills, believes it to be an integral part of Broca's area. Motor aphasia may result from lesion of Broca's convolution and the insula or from lesion of either of these areas, although the aphasia may be more partial in those cases in which both Broca's convolution and the insular are not involved together. This last remark would apply in part to what Dr. Dana has said as well as to Dr. Dercum's remarks.

Dr. Onuf seemed simply to be repeating his (Dr. Mills') opinion and that of Dr. Spiller with regard to the functions of the lenticula; namely, that it is concerned with the mechanical act of speech, not with the organization of language for expression any more than with sensorial images.

Dr. Mills said that he did not believe that he and Dr. Prince were far apart.

Dr. Spiller said that the functions of the lenticular zone is one of the most difficult subjects, and he has no doubt that after further investigation he may alter some of his views. He said that the lenticular zone is defined very accurately by Marie, and includes the island of Reil. In his use of the word anarthria Marie says he does not care to coin a word, and so uses one already in existence, but uses it in a somewhat different sense.

Dr. Spiller said that he had never denied that a destruction of the posterior part of the left first temporal convolution may exist without sensory aphasia, because at the time of the meeting to which Dr. Knapp refers he (Dr. Spiller) had reported a case in which that zone was destroyed without sensory aphasia existing.

Dr. Spiller said that Dr. Prince's remark on the possible changes occurring in the nerve cells of Broca's area as a result of injury of the fibers coming from these cells, was important, and such changes should be taken into consideration in judging of the integrity of this area.

Dr. C. L. Dana said that his own observations of the cases of lenticular lesions which he had reported are mainly negative, but they are positive in this respect; they seem to him to show conclusively that the lenticular nucleus and the corpus striatum in general are not a center for language, and that both can be destroyed without producing aphasia. He does not think that any facts have been presented that show that the lenticular nucleus has any control over speech except that dysarthria may occur. Dr. Browning reported a case of double lesion of the lenticular nucleus with pseudo-bulbar paralysis, and other cases have been reported. There have been a good many more cases of lesion of that region without any such symptoms.

Dr. Dana said he would like to mention one point with regard to the gas poisoning cases. He thought that we cannot make out anything regarding the function of the lenticular nucleus from a few cases of gas poisoning, but he was looking for the late effects of gas poisoning which were due probably to a softening of the lenticular nuclei.

Dr. F. X. Dercum said that it is not the first time in the history of medicine that we have been obliged to unlearn facts, or supposed facts, and he believes that this is the position we will be obliged to take with regard to the function of the left third frontal convolution. The historical facts with regard to Broca's first cases are of extreme interest. It has been shown by Marie that in Broca's first cases there was not only a lesion of the third frontal but also of Wernicke's region as well. His second case was one, the history of which reads not like a case of aphasia, but of senile dementia. We must remember that these cases were studied in the very early years when notions with regard to speech function were very vague. With regard to the question of anarthria, Dr. Dercum said that it is perfectly true, as Dr. Dana says, that you may have a lesion of the lenticular nucleus on one side and only anarthria. If you have a double lesion of the lenticular nucleus you have the same condition present as in pseudobulbar paralysis. When do you have the difficulty of enunciating words in connection with aphasia? Just as soon as you have in addition to a lesion of the zone of Wernicke also a lesion of the lenticular zone or of the inferior longitudinal fasciculus. Dr. Dercum said he agreed with Dr. Prince that every case should be studied microscopically, but first we have to do our gross work. At the same time if the third frontal convolution has to do with speech, he thinks it is incumbent upon those who maintain that old view to prove it.

THE LOCALIZATION OF THE MOTOR AREA BASED UPON EXACT FARADIZATION.

By Dr. Alfred Gordon.

A case of focal epilepsy, in which the convulsions were confined to the left arm. A large osteoplastic flap was removed and the Rolandic area was exposed. Careful fradization with the unipolar method showed that irritation of the ascending frontal convolution and of the fissure itself gave distinct contractions on the opposite side. Irritation of the ascending parietal convolution gave also contractions on the opposite side, but far less marked.

A Stury in Tactual Localization in a Case Presenting Astereognosis and Asymbolia Due to Injury to the Cortex of the Brain. By Dr. Morton Prince. (*See this journal,* p. 1.)

Dr. M. Allen Starr said he felt that this paper of Dr. Prince's is a very interesting one. It is very evident that careful psychological analysis must go along with our analysis of the symptomatology in all these cases. He said he had been accustomed to teach that the symptom of astereognosis was due not so much to the loss of function of any special area of the cortex as to the interference with the association processes that are necessary to the building up of the concept, using the word concept in Charcot's sense, which is familiar in his illustration of the concept "bell." The point in the brain where the majority of these association fibers cross one another lies just beneath the cortex of the inferior parietal lobule just posterior to the posterior central convolution, and all the cases that Dr. Starr could get together that presented symptoms of astereognosis showed a lesion of that area of the brain, not merely cortical, but many of them (and he thought practically all of them), involving the subcortical association fibers that pass beneath the cortex at that point. It seemed to him, therefore, in speaking of astereognosis, as Dr. Prince has very well brought out, we are dealing with a complex association process rather than with the loss of a single sense, and that the reason why we have to locate the astereognosis lesion at that region is because that is the region where these association fibers particularly intersect.

Dr. P. C. Knapp said he had always felt much skepticism about this question of astereognosis, primarily from the fact that he had never yet encountered the report of a pure case of astereognosis; namely, a case of the inability to recognize an object when every form of tactile and muscular sensibility was normal. Even to-day our ideas of the visual and auditory agnoses have received what might be termed a jolt, as was shown in the discussions of aphasia at this meeting; but the idea that was formulated in regard to both soul blindness and soul deafness, or better visual agnosis and auditory agnosis, was that those conditions were the inability to recognize by sight or by hearing, although the visual sense